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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/773,815      | 01/31/2001  | William T. Carpenter | P01426US2           | 8585             |

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EXAMINER

KRECK, JOHN J

ART UNIT PAPER NUMBER

3673

DATE MAILED: 08/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

|                              |                 |                       |  |
|------------------------------|-----------------|-----------------------|--|
| <b>Office Action Summary</b> | Application No. | Applicant(s)          |  |
|                              | 09/773,815      | CARPENTER, WILLIAM T. |  |
|                              | Examiner        | Art Unit              |  |
|                              | John Kreck      | 3673                  |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 4 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 11-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 11-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. ____.  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date ____.   | 6) <input type="checkbox"/> Other: ____.                                    |

### DETAILED ACTION

1. Prosecution on the merits of this application is reopened on claims 11-20 considered unpatentable for the reasons indicated below:

#### ***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 11-20 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification is not sufficiently complete to provide reasonable guidance or enablement to one of ordinary skill in the art to determine "a position and a mass of a compensating substance sufficient to effect the moment of stability" as set forth in claim 11, lines 8-9.

In summary of applicant's disclosure, applicant starts with a statement, page 4, lines 13-14, "redistribution [of mass] will change the center of mass of the Earth thereby causing a change in the earth-rotation vector", then sets forth a number of assumptions, page 4, lines 21-22, i.e. "the earth is a rotating body with a known mass, size, shape, center of mass and axis characteristics" therefore a solid mass, then sets

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forth the "first step is to determine an optimum point to add or reduce mass to cause the desired change to the axis of rotation", and then the "next step would be to alter the mass at that point...that would produce the desired effect". The only support of the determining steps by the applicant is a vague statement that "Such result can be reasonably determined by one of ordinary skill in the art", page 4, lines 27-28. No formulas, calculations, or even what factors are considered by one of ordinary skill to calculate the position and the scale of the mass. With respect to pages 5-6, applicant sets forth a number of ideas and proposals for what type of mass, i.e., water or soil, to move and what might hold the water or soil, i.e., above or underground cavities, but fails to set forth if any one of these locations is the position determined. What if the determined position is in the ocean, since three quarters of the earth is covered in water?

One of ordinary skill in the art could not be able to calculate the "position and a mass of a compensating substance sufficient to effect the moment of stability" in accordance with applicant's claimed invention, because the shape, center of mass and axis characteristics of the earth are constantly changing and therefor not a solid mass, but a fluid mass. Applicants describe this effect as a figure eight "Wobble" known as the Chandler Effect, wherein the axis of rotation of the earth moves in a figure eight pattern. The center of mass and shape of the earth are changed daily, monthly and yearly, due to the ocean tides, evaporation and the gravitational effect to the Sun, Moon and planets. On a grander scale, applicants set forth on page 3 of the instant specification, that over 100 trillion tons of mass have been redistributed on the planet

earth during the last 100 years. On an even grander scale, the center of mass and shape of the earth are changed by continental drift, plate tectonics, and glacier movements. The instant specification fails to provide guidance on this fact that the shape, center of mass and axis characteristics of the earth are changing.

Further, the instant specification does not provide evidence or reasoning that when the mass is positioned that the natural dynamics of a fluid earth with its gravitational field, would not revert back to the current center of mass. If applicants were to move 100 trillion tons of water onto a land mass at a certain elevation to sufficiently effect the moment of stability, then the land mass would compress and sink to thereby lower the elevation of the water. This may nullify the effect on the axis characteristics of the earth, since the elevation of the more dense land mass has been lowered or the tectonic plate may move vertically due to the weight. If applicants were to move 100 trillion tons of water to a location in the middle of the ocean, then there would be little to no change in the center of mass, shape and axis characteristics of the earth.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

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4. Claims 11 and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by "Terraforming Venus".

"Terraforming Venus" teaches a process of modifying the axis of rotation of a planet comprising:

measuring the mass of the planet (e.g. page 50, column 2, in the box labeled "Venus");

determining the center of mass (this is implicit in this statement found in the second paragraph on page 50: "the asteroid should hit Venus as far from its axis of rotation as possible, that is, along its equator");

characterizing the axis of rotation of the planet (e.g. a 127 earth-day rotation);

selecting a desired character of rotation (see, e.g. the paragraph spanning columns 1 and 2 on page 51);

calculating a moment of stability (e.g. the sum of angular momentum as disclosed on page 50 in the last paragraph of column 1);

determining a position and mass and positioning the mass (e.g. colliding the asteroid with Venus) as called for in claim 11.

"Terraforming Venus" also discloses the solid (asteroid) as called for in claim 14.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over "Terraforming Venus" in view of Storaasli (U.S. Patent number 5,597,141) and the Mining Engineering Handbook.

"Terraforming Venus" teaches a process of modifying the axis of rotation of a planet comprising: measuring the mass of the planet; determining the center of mass; characterizing the axis of rotation of the planet; selecting a desired character of rotation; determining a position and mass and positioning the mass. "Terraforming Venus" teaches a process which uses a collision with an asteroid to position the mass; and lacks the mass in a cavity.

Storaasli teaches a process for modifying the axis of rotation of a satellite; which includes similar steps of measuring the mass, determining the center of mass, characterizing the axis of rotation, selecting a desired character of rotation, determining a position and mass, and positioning the mass. Storaasli also teaches the compensating substance within a cavity; in order to protect it. One of ordinary skill in the art would recognize that the Storaasli process would have an advantage in that the process could easily be reversed or adjusted.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the process taught in "Terraforming Venus" in the manner shown by Storaasli, and also having the compensating substance in a cavity, in order to protect it. It is noted that Storaasli fails to teach an underground cavity, however underground cavities are well known to provide shelter; as evidenced by the Mining text.

It would have been further obvious to one of ordinary skill in the art at the time of the invention to have further modified the process to have included an underground cavity as called for in claim 12.

6. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over "Terraforming Venus" in view of Storaasli (U.S. Patent number 5,597,141).

"Terraforming Venus" teaches a process of modifying the axis of rotation of a planet comprising: measuring the mass of the planet; determining the center of mass; characterizing the axis of rotation of the planet; selecting a desired character of rotation; determining a position and mass and positioning the mass. "Terraforming Venus" teaches a process which uses a collision with an asteroid to position the mass; and lacks the mass in a cavity.

Storaasli teaches a process for modifying the axis of rotation of a satellite; which includes similar steps of measuring the mass, determining the center of mass, characterizing the axis of rotation, selecting a desired character of rotation, determining a position and mass, and positioning the mass. Storaasli also teaches the compensating substance within a cavity; in order to protect it. One of ordinary skill in the art would recognize that the Storaasli process would have an advantage in that the process could easily be reversed or adjusted.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the process taught in "Terraforming Venus" in the manner shown by Storaasli, and also having the compensating substance in a cavity, in order to



protect it. It is noted that Storaasli fails to explicitly teach an aboveground cavity.

Official Notice is taken of the fact that aboveground cavities (e.g. a conventional building or factory structure) are well known, and known to have the advantage of protecting machinery. It would have been further obvious to one of ordinary skill in the art at the time of the invention to have further modified the process to have included an aboveground cavity as called for in claim 13.

7. Claims 13, 15, 17, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Terraforming Venus" in view of Hubert (U.S. Patent number 5,058,834).

"Terraforming Venus" teaches a process of modifying the axis of rotation of a planet comprising: measuring the mass of the planet; determining the center of mass; characterizing the axis of rotation of the planet; selecting a desired character of rotation; determining a position and mass and positioning the mass. "Terraforming Venus" teaches a process which uses a collision with an asteroid to position the mass; and lacks the mass in a cavity.

Hubert teaches a process for modifying the axis of rotation of a satellite; which includes similar steps of measuring the mass, determining the center of mass, characterizing the axis of rotation, selecting a desired character of rotation, determining a position and mass, and positioning the mass. Hubert also teaches the compensating substance is a liquid within a cavity; in order to protect and contain it. One of ordinary

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skill in the art would recognize that the Hubert process would have an advantage in that the process could easily be reversed or adjusted.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the process taught in "Terraforming Venus" in the manner shown by Hubert, and also having the liquid compensating substance in a cavity, in order to protect and contain it. It is noted that Hubert fails to explicitly teach an aboveground cavity. Official Notice is taken of the fact that aboveground cavities (e.g. a conventional building or factory structure) are well known, and known to have the advantage of protecting machinery. It would have been further obvious to one of ordinary skill in the art at the time of the invention to have further modified the process to have included an aboveground cavity as called for in claim 13.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the process taught in "Terraforming Venus" in the manner shown by Hubert, and thus having the substance a liquid as called for in claim 15.

Hubert teaches liquid as called for in claim 17.

With regards to claim 20: the cited references fail to teach water: official notice is taken of the fact that water is well known to be used as a liquid compensating mass (e.g. in tractor tires, ship ballast, and rollers) Water is well known to have the advantages of low cost and non-polluting. It would have been further obvious to one of ordinary skill in the art at the time of the invention to have used water as the compensating substance as called for in claim 20.

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8. Claims 12, 16, 18, and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over "Terraforming Venus" in view of Hubert (U.S. Patent number 5,058,834) and the Mining Engineering Handbook.

"Terraforming Venus" teaches a process of modifying the axis of rotation of a planet comprising: measuring the mass of the planet; determining the center of mass; characterizing the axis of rotation of the planet; selecting a desired character of rotation; determining a position and mass and positioning the mass. "Terraforming Venus" teaches a process which uses a collision with an asteroid to position the mass; and lacks the mass in a cavity.

Hubert teaches a process for modifying the axis of rotation of a satellite; which includes similar steps of measuring the mass, determining the center of mass, characterizing the axis of rotation, selecting a desired character of rotation, determining a position and mass, and positioning the mass. Hubert also teaches the compensating substance is a liquid within a cavity; in order to protect and contain it. One of ordinary skill in the art would recognize that the Hubert process would have an advantage in that the process could easily be reversed or adjusted.

It would have been obvious to one of ordinary skill in the art at the time of the invention to have modified the process taught in "Terraforming Venus" in the manner shown by Hubert, and also having the liquid compensating substance in a cavity, in order to protect and contain it. It is noted that Hubert fails to teach an underground cavity, however underground cavities are well known to provide shelter, and to store liquids; as evidenced by the Mining text. It would have been further obvious to one of

ordinary skill in the art at the time of the invention to have further modified the process to have included an underground cavity as called for in claim 12.

Hubert teaches liquid as called for in claim 16.

With regards to claims 18 and 19: the cited references fail to teach water: official notice is taken of the fact that water is well known to be used as a liquid compensating mass (e.g. in tractor tires, ship ballast, and rollers) Water is well known to have the advantages of low cost and non-polluting. It would have been further obvious to one of ordinary skill in the art at the time of the invention to have used water as the compensating substance as called for in claims 18 and 19.

9. Claims 11-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chao "Excitation of the Earth's Polar Motion due to Mass Variations in Major Hydrological Reservoirs" (referred to as Chao "Excitation"). Chao "Excitation" discloses a method of determining how the axis of rotation of a planet is modified by the movement of a mass (water) to a predetermined position (hydrological reservoirs), including measuring the mass of a planet (M), determining the center of mass of a planet and characterizing the axis of rotation of the planet (J2, page 13,811 col. 2, line 37 and page 13,814 col. 1, line 60 - col. 2, line 7), positioning the mass of water in the position (Table 2 which includes the mass/capacity of water and the position (latitude, longitude) of the positioned/artificial created water masses), calculating a moment of stability (page 13,811 col. 2, lines 24 to page 13, 812 col. 1, lines 12), and determining a position and a mass of compensating substance (page 13, 812 col. 1, lines 2-12)

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wherein two identical  $\Delta m(t)$  situated on the same latitude but 180 degrees apart in longitude will cancel each other in the contributions to polar motion excitation function. With respect to the phrase a mass "sufficient to effect the moment of stability", Chao "Excitation" sets forth a  $\Delta m$  of larger than  $10^{13}$  kg for the polar motion excitation function to change by more than 1 mas (page 13,812 col 2, lines 22-31), even though Chao "Excitation" suggest on page 13,811 col. 1, lines 12-29) that smaller mass movements, i.e., shipping of petroleum and goods or formations of polar sea ice, floating icebergs, may effect the polar motion. Chao "Excitation" does not explicitly disclose selecting a desired character of rotation and then positioning the mass at a determined position to effect the moment of stability of the earth. Chao "Excitation" teaches the effects of the character of rotation and moment of stability of the earth caused by masses of water (major artificial reservoirs) positioned around the earth and also teaches (page 13, 812 col. 1, lines 2-12) that a change in mass  $\Delta m$  located on longitudinal ( $\lambda$ ) will push the excitation pole to the opposite longitudinal ( $\lambda+180^\circ$ ), while a negative  $\Delta m$  will do the opposite, pulling the pole toward ( $\lambda$ ). Therefore, Chao "Excitation" teaches one of ordinary skill in the art a method of selecting a desired character of rotation to counter the effects of the major artificial reservoirs, calculating a moment of stability required to cause this desired character of rotation (as set forth above), determining a position and a mass, i.e., an equal and opposite  $\Delta m$  for each of the major artificial reservoirs at a location  $180^\circ$  of longitude away from each of the major artificial reservoirs, and positioning the masses in the locations to counter the adverse effects of the major artificial reservoirs. It would have been obvious to one of ordinary

skill in the art to extend the teachings of Chao "Excitation" to selecting a desired character of rotation, determining a position and a mass sufficient to effect the moment of stability and positioning the mass at a location to counter the change in character of the rotational axis due to the artificial reservoirs as taught by Chao "Excitation".

With respect to claims 12, 13, and 15-20, Chao "Excitation" discloses that masses of a compensating substance sufficient to effect the moment of stability are "hydrological reservoirs, including major natural lakes, artificial reservoirs (claim 13 above ground cavity), and a groundwater aquifer (claim 12 underground cavity)" (Page 13, 811 col. 1, lines 6-8).

With respect to claim 14, Chao "Excitation" discloses that the changing mass substance is solid, i.e., "polar and alpine glaciers" (Page 13,811 col. 2, lines 42,43).

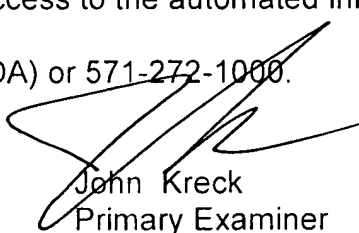
Any inquiry concerning this communication or earlier communications from the examiner should be directed to John Kreck whose telephone number is 571-272-7042.

The examiner can normally be reached on Mon-Thurs 530am-2pm; Fri: telework.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patricia Engle can be reached on 571-272-6660. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.


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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



John Kreck  
Primary Examiner  
Art Unit 3673

14 August 2006



APPROVED BY  
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